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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/602,049	06/23/2000	Michael H L Cheng	380112-141	9505

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EXAMINER

BLAU, STEPHEN LUTHER

ART UNIT	PAPER NUMBER
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3711

DATE MAILED: 12/28/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/602,049

Applicant(s)

CHENG, MICHAEL H L

Examiner

Stephen L. Blau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2001.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-15 and 17-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-15 and 17-34 is/are rejected.
- 7) ☒ Claim(s) 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 20 is indefinite in that the statement "each of the plurality of resin layers" does not make sense. There is improper antecedent basis for this limitation in the claim. Claim 19 only states a single plurality of resin layers. ✓

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 5, 7-11, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauritis in view of Roy.

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Lauraitis discloses a plurality of fiber reinforced resin layers (Abstract), a plurality of first fibers in the form of carbon defining a first length of 8 inches located between two of the resin layers (Ref. No. 22A, Fig. 2, Col. 2, Lns. 8-13), a plurality of second fibers in the form of carbon defining a second length of 10 inches located between two of the resin layers (Ref. No. 21A, Fig. 10, Col. 2, Lns. 8-13), the second length being greater than the first length (Fig. 2), first and second fibers defining longitudinal ends, one of the longitudinal ends of each fiber being aligned with a tip end of a shaft (Fig. 2), carbon fibers preferred due to high modulus and low density (Col. 2, Lns. 8-13), a plurality of third fibers defining a third length (Ref. No. 20, Fig. 2) located between two fiber reinforced resin layers (Ref. Nos. 31, and 16), the third length being greater than the second length (Fig. 2), and first and second fibers being located between the same two resin layers (Ref. Nos. 31 and 16).

For claim 3, Lauraitis discloses a plurality of fiber reinforced resin layers (Fig. 6, Outer layer, Ref. Nos. 33-38), a plurality of first fibers defining a first length located between two of the fiber reinforced resin layers (Ref. No. 44), a plurality of second fibers in the form of carbon defining a second length located between two of the fiber reinforced resin layers (Ref. No. 43), the second length being greater than the first length (Fig. 6), first and second fibers defining longitudinal ends, one of the longitudinal ends of each fiber being aligned with a tip end of a shaft (Fig. 6), carbon fibers preferred due to high modulus and low density (Col. 2, Lns. 8-13), a group of layers with fibers angled with respect to the longitudinal axis of a shaft (Fig. 6, Ref. Nos. 34-38), and a

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group of layers with fibers substantially parallel to a longitudinal axis (Ref. Nos. 33 and Outer layer).

Lauraitis lacks a first fiber and a second fiber being a metal and a metal fiber being a relatively heavy metal fiber. Roy discloses forming a shaft using carbon or boron fiber due to each having a high modulus attribute (Col. 3, Lns. 6-9). In view of the patent of Roy it would have been obvious to modify the shaft of Lauraitis to have all the carbon fibers being a boron metal fiber in order to have even a lower density shaft due to boron having a lower atomic weight than carbon. This would enable a weaker player to swing a shaft faster. As such the first and second fibers would be metal in the form of boron and the metal fiber would be relatively heavy metal fiber compared to beryllium fibers.

3. Claims 1, 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauraitis in view of Jackson.

Lauraitis lacks a first fiber and a second fiber being tungsten. Jackson discloses forming a shaft using carbon or boron or tungsten (Claim 10, Col. 2, Lns. 52-65) in order to have properties as desired (Col. 9, Lns. 59-67). In view of the patent of Jackson it would have been obvious to modify the shaft of Lauraitis to have all the carbon fibers being a tungsten metal fiber in order to have even a higher density shaft due to tungsten having a higher atomic weight than carbon. This would result in a shaft with a higher swing weight which would allow a strong golfer to transfer more energy to a ball at contact for the same swing compared to a shaft having carbon fibers.

4. Claims 1, 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauraitis in view of Takezawa.

Lauraitis discloses a plurality of third metal fibers defining a third length of at least about 20 inches in the form of about 40 inches (Ref. No. 20, Fig. 2).

Lauraitis lacks a first, second, and third fiber being titanium. Takezawa discloses forming a shaft (Col. 1, Lns. 23-30) using titanium fibers (Col. 2, Lns. 21-61). In view of the patent of Takezawa it would have been obvious to modify the shaft of Lauraitis to have all the carbon fibers being a titanium metal fiber in order to have even a higher density shaft due to titanium having a higher atomic weight than carbon. This would result in a shaft with a higher swing weight which would allow a strong golfer to transfer more energy to a ball at contact for the same swing compared to a shaft with carbon fibers.

5. Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemura in view of Roy.

Takemura discloses a plurality of fiber reinforced resin layers (Abstract, Col. 6, Lns. 23-31), a plurality of first fibers in the form of carbon defining a first length (Ref. No. 4b, Fig. 3) located between two of the fiber reinforced resin layers (Ref. No. 4c, 2a, 2b and 3, Fig. 3), a plurality of second fibers in the form of carbon defining a second length (Ref. No. 4a, Fig. 3) located between two of the fiber reinforced resin layers (Ref. No. 4c, 2a, 2b and 3, Fig. 3), the second length being greater than the first length (Fig. 3), first and second fibers defining longitudinal ends, one of the longitudinal ends of each

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fiber being aligned with a tip end of a shaft (Fig. 3) and first and second fibers being substantially linear (Ref. No. 4a, 4b).

Takemura lacks a first fiber and a second fiber being a metal. Roy discloses forming a shaft using carbon or boron fiber due to each having a high modulus attribute (Col. 3, Lns. 6-9). In view of the patent of Roy it would have been obvious to modify the shaft of Takemura to have all the carbon fibers being a boron metal fiber in order to have even a lower density shaft due to boron having a lower atomic weight than carbon. This would enable a weaker player to swing a shaft faster. As such the first and second fibers would be metal in the form of boron.

6. Claims 1 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fenton in view of Roy.

Fenton discloses a plurality of fiber reinforced resin layers (Figs. 2-5, 7, Ref. Nos. 15, 17, and 25, Col. 4, Lns. 9-21), a plurality of first fibers in the form of carbon defining a first length located between two of the fiber reinforced resin layers (Ref. No. 19, Fig. 3, Col. 3, Lns. 37-42), a plurality of second fibers in the form of carbon defining a second length located between two of the fiber reinforced resin layers (Ref. No. 23, Fig. 4, Col. 3, Lns. 37-42), the second length being greater than the first length (Figs. 3-4), a first fiber defining an longitudinal end (Fig. 3), and an outer most resin layer is formed from a resin pre-impregnated fiberglass sheet (Col. 3, Lns. 40-42).

Fenton lacks a first fiber and a second fiber being a metal, a second fiber defining a longitudinal end, one of the longitudinal ends of each first and second fiber being aligned with a tip end of a shaft. Roy discloses forming a shaft using carbon or

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boron fiber due to each having a high modulus attribute (Col. 3, Lns. 6-9) and layers having longitudinal ends such that the fibers are aligned with a tip end of a shaft (Ref. Nos. 24, 40). In view of the patent of Roy it would have been obvious to modify the shaft of Fenton to have all the carbon fibers being a boron metal fiber in order to have even a lower density shaft due to boron having a lower atomic weight than carbon. This would enable a weaker player to swing a shaft faster. As such the first and second fibers would be metal in the form of boron. In addition, in view of the patent of Roy it would have been obvious to include in the shaft of Fenton a second fiber defining a longitudinal end, and one of the longitudinal ends of each first and second fiber being aligned with a tip end of a shaft in order to provide reinforcement to a shaft all the way to the tip end.

7. Claims 19-22, and 24-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takezawa in view of Lauraitis.

Takezawa a plurality of fiber reinforced resin layers (Ref. Nos. 101, 102, Fig. 19, Col. 22, Lns. 11-21, 34-36, 39-45), a plurality of first metal fibers in the form of stainless steel defining a first length located between two resin layers (Ref. No. 1, 6B, Figs. 13, 19, Col. 11, Lns. 46-51, 64-68), a plurality of second metal fibers in the form of boron defining a second length located between two resin layers (Ref. No. 1, 6A, Fig. 19, Col. 11, Lns. 42-43), a first metal fiber comprising a relatively heavy metal fiber in the form that stainless steel has a greater density than boron, a plurality of third metal fibers located between two of the resin layers, the third metal fiber being formed from a

different metal than a first and second metal fibers in the form of titanium fibers (Ref. No. 1, 6B, Figs. 13, 19, Col. 11, Lns. 46-51, 64-68), a plurality of layers with fibers running straight and angled (Col. 22, Lns. 23-36), and first and second metal fibers are located between the same two resin layers (Fig. 19). Takezawa is silent to the direction of the metal fiber layers but clearly an artisan skilled in the art of forming shafts with a certain amount of longitudinal flexibility would have selected a suitable direction for the metal fibers in which a linear direction along the axis of a shaft is included.

Takezawa lacks a tip, a tip section, a main body section, a butt, a second length being greater than the first length, third length being greater than a second length, first and second metal fibers being linear, and an outer most layer formed with fiberglass. Lauraitis discloses a shaft having a tip, a tip section, a main body section, a butt (Figs. 1-2), middle layers having more than two different heights from a tip end (Figs. 3, 6), and carbon is a preferred fiber over glass due to the density of glass (Col. 2, Lns. 8-13). In view of the patent of Lauraitis it would have been obvious to modify the shaft of Takezawa to have a tip, a tip section, a main body section, and a butt in order to maximize the velocity of a tip end of a shaft when impacting a ball. In addition, in view of the patent of Lauraitis it would have been obvious to modify the shaft of Takezawa to have more than one middle layer (Ref. No. 1, Fig. 19) in order to have a stronger shaft and to have middle layers having three or more different lengths such that second metal fibers having a second length in a second middle layer will have a second length greater than a first length of first metal fibers in a first middle layer and third metal fibers having a third length in a third middle layer with a third length being greater than a second

length in order to have a more flexible section of a shaft at a butt section for a golfer who prefers a stronger and stiffer shaft overall but not as great of an increase in the butt section of a shaft. In addition, in view of the patent of Lauraitis it would have been obvious to modify the shaft of Takezawa to have and an outer most layer formed with fiberglass in order to form a shaft with a higher swing weight for a stronger golfer who desires to transfer more energy to a ball at impact for the same swing.

It would have been obvious to modify the shaft of Takezawa to have first and second metal fibers being linear in order to maximize the longitudinal stiffness of the shaft.

8. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takezawa in view of Lauraitis as applied to claims 19-22 and 24-34 above, and further in view of Jackson.

Takezawa discloses metal fibers such as titanium and stainless steel (Col. 11, Lns. 50-52).

Takezawa lacks a first metal fiber being tungsten. Jackson discloses forming a shaft using tungsten fibers (Claim 10, Col. 2, Lns. 52-65) in order to have properties as desire (Col. 9, Lns. 59-67). In view of the patent of Jackson it would have been obvious to modify the shaft of Takezawa to have one of the metal fibers being a tungsten metal fiber instead of stainless steel in order to use the density of tungsten to form a shaft having a swing weight which would better fit a golfer than if stainless steel fibers where used.

Allowable Subject Matter

9. Claim 35 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art discloses or renders as obvious at least one of the plurality of relatively heavy metal fibers, the plurality of relatively stiff metal fibers, and the plurality of relatively resilient metal fibers being located between a different two of the fiber reinforced resin layers than the other.

Response to Arguments

10. The argument that adding the element of claim 2 to claim 1 obviates the rejection of claims 1, 4, 5-7 and 11-14 under 35 U.S.C. 103 is disagreed with. Amended claim 1 reads on the art used to previously reject under 35 U.S.C. 103 for claims 1, 4, 5-7 and 11-14. The arguments that it is improper to combine the references of Takezawa and Lauraitis since Lauraitis does not disclose metal fibers or metal fibers of different lengths are disagreed with. Lauraitis was not used to show metal fibers but that it is known to have middle layers of different lengths. Takezawa was used to show metal fibers. In addition, Takezawa is quiet with respect to the longitudinal wall thickness, longitudinal shaft diameter, and the pattern of layers in the longitudinal direction. Lauraitis shows a suitable pattern of layers to achieve longitudinal desired affects. It

would be obvious to select this known pattern to have a stiff tip end and a flexible butt end. Fenton, Roy and Takemura also show middle layers with different lengths. The examiner believes these references are sufficient for the position taken and as such no affidavit will be supplied.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steve Blau whose telephone number is (703) 308-2712.

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The examiner is available Monday through Friday from 8 a.m. to 4:30 p.m.. If the examiner is unavailable you can contact his supervisor Paul Sewell whose telephone number is (703) 308-2126. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0858.

Slb 21 December 2001

A handwritten signature, possibly reading 'S', is written over the date.

Paul T. Sewell
Supervisory Patent Examiner
Group 3700

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may **NOT** be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.